

diseases, as cardiac, nephritis, Basedow's, or very frail women, it is more a question of the effect on the mother's general condition and strength than on her actual ability to nurse her baby that must decide the question of weaning. Insanity is a contraindication unless someone is constantly with the mother during nursing and even then it is often a dangerous risk. Epilepsy is also a contraindication unless the mother can be watched during nursings. During prolonged, acute, infectious diseases weaning is usually to be advised because of danger of transmission and because the drain on the mother's strength is often too much. However, during short febrile attacks, if contagion or infection of the baby can be avoided or minimized, there is no need of weaning. Infection of the glands of one breast need not stop nursing of the other. In fact the infected breast will usually recover much more rapidly if it is thoroughly and regularly emptied by pumping out the milk, however painful this process may be.

In this as in most things, prevention is much to be desired over cure. Mastitis is at best a tedious and painful condition and can be successfully avoided by proper care of the breasts, a care which should begin at least six weeks before the baby is born, by regular massage, bathing and so hardening the nipples that they will not crack. If the nipples are washed off with boracic acid water two or three times a day and the breasts lightly massaged, retracted nipples pulled out either by manipulation or by suction with a breast pump, abrasions and cracked nipples will be less frequent and the greatest causes of infected breasts removed. The careful cleaning of the breasts before and after nursing are factors only to be mentioned to realize its importance. The complete emptying of the breasts is also a much neglected factor in the occurrence of breast infections. A vigorous, healthy baby will usually completely empty the breasts, but where this is not done a breast pump will prevent not only much discomfort by emptying the breast but will also prevent caking of the breast and will further prolong the activity of the breasts up to such a time as the baby is strong enough to empty the breasts by itself.

Menstruation does not usually affect the milk except in cases where the flow is excessive, in which case the quantity of milk may be diminished or if the mother is markedly weakened or indisposed, there may be a temporary change in the milk for the period of one or two days, during this time one or two extra bottle feedings may be instituted and nursing resumed when the mother is herself again. But to advise weaning because menstruation has begun is a mistake in the vast majority of cases.

Pregnancy in itself is an indication for weaning only after the third month. Often a pregnant mother is able to nurse without any effect on her general condition and health until the sixth month, after that it should be discontinued because of the mother's own condition, uncontrollable nausea or general fatigue or weakness being in themselves sufficient causes for weaning.

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ORIGINAL ARTICLES

DUODENAL FEEDING—A PRACTICAL DEMONSTRATION.*

By HARRY G. WATSON, M. D., Los Angeles.

The method of duodenal feeding was introduced about four years ago by Prof. Max Einhorn, whom I have had the pleasure of assisting for many years at the New York Post-Graduate Medical School and Hospital. The introduction of the duodenal tube has been a wonderful help in the diagnosis and treatment by medicines and food of gastro-intestinal disease, from babyhood to old age. The duodenal tube is a soft rubber tube about a meter in length and 3.5 m.m. in diameter ending in a gold perforated tip.

Dr. Einhorn's duodenal feeding apparatus is made by Tiemann & Co., of New York, and consists of the following:

1. The duodenal tube with a gold perforated tip.
2. A triple petcock, one rubber tube connecting with the duodenal tube, one with the glass of nourishment and the other with the glass syringe.
3. A flat piece of wood covering the glass.

The duodenal tube is swallowed by the patient at night and allowed to go as far as the line marked on the tube about 80 c.m. and the tip will then be in the duodenum. If there is obstruction at the pylorus or much pylorospasm the tube may be delayed or may not enter the duodenum at all. The principle of this method of feeding is to give the stomach rest, which you know is the best state for a diseased organ. The following are the principal indications for duodenal feeding:

1. Ulcer of the stomach and duodenum.
2. Any condition of the stomach where rest is indicated.
3. Gastroparesis with or without stasis where there is no organic obstruction.
4. Where nutrition by the stomach seems impossible as in cardiospasm, pylorospasm, nervous vomiting, or severe vomiting of pregnancy.
5. In inoperable malignant conditions of the stomach or cardia, if the tube can pass through the stomach into the duodenum, this will prevent vomiting and decomposition of food in the stomach.
6. Dr. Einhorn recommends it in cirrhosis of the liver.
7. In the treatment of amebic dysentery it is recommended by Dr. W. Gerry Morgan of Washington that the ipecac be administered direct with the duodenal tube. This is also recommended by Dr. Vedder of the United States army in connection with hypodermic injection of emetine which kills the ameba in the tissue while ipecac destroys them in the intestinal tract.

There are several ways of testing whether or not the tube is in the duodenum. If air is forced through, the patient can feel the air if the tip is in the stomach but not so if the tube is in the duodenum. Secondly, if the tip is in the

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stomach an acid liquid will be aspirated unless there is achylia, while very little liquid can be withdrawn if the tube is in the duodenum, as it is usually empty and the reaction is alkaline.

Finally, if the patient be given a colored liquid to drink and the tube is in the duodenum the liquid withdrawn will be colorless but if the tip is in the stomach the liquid will be colored. Now that we are certain the tube is in the duodenum the feedings are given every two hours from 7 a. m. to 7 or 9 p. m. Each feeding consists of seven or eight ounces of milk, one raw egg and a tablespoonful of lactose. A tablespoonful of melted butter can be added to each feeding if the patient loses weight. This will bring up the day's food value to about 3000 calories, which are more than enough to sustain the nitrogen equilibrium and loss in weight. This food should be administered after it is strained, should be warm and given very slowly, requiring about twenty minutes.

The method of giving the food is simple if done properly but troublesome if done improperly as the tube will become clogged and necessitate its removal. If all goes well, the tube remains in the duodenum the whole time of treatment which is from two to three weeks.

This is the way the food is given: The food is drawn up with the syringe and then very slowly with a screw like motion is injected through the tube into the duodenum. This is continued until all the food is given. After each feeding, a little warm water should be injected through the tube and then a little air, so as to keep the tube clean and empty. Besides the feedings a pint of saline should be given once a day into the rectum by the drop method or through the tube into the duodenum.

Care should be exercised that the food is not injected too quickly or too hot or too cold as the duodenum is very sensitive, otherwise the patient will have a feeling of discomfort or nausea.

The feedings can be given by the nurse or by the patient provided a careful demonstration has been given. This method is now being used in many hospitals in this country and abroad and by many physicians in the homes of their patients.

RADIOLOGIC DIAGNOSIS OF GASTRO-DUODENAL ULCERS.*

By W. W. BOARDMAN, M. D., Assistant Professor of Medicine, Stanford University Medical School, San Francisco.

Gastric and duodenal ulcers produce functional and organic changes in the gastro-intestinal tract. Proper radiologic examination will graphically demonstrate certain of these functional and organic changes. In some, these demonstrated changes are so typical that a diagnosis of gastric or duodenal ulcer may be made on these findings alone; in others, this evidence is merely suggestive. In all cases, the radiologic evidence must be carefully correlated with the findings obtained by the other methods of examination. By this means and this

means alone can we obtain satisfactory results and avoid serious errors. The X-ray is not to be looked to as an infallible means of diagnosing gastric or duodenal ulcers. It is merely a procedure which, when properly applied and the results properly interpreted, is a most valuable addition to our other methods of examination and furnishes information unobtainable by other procedures.

During the past fifteen years and more especially since the introduction of the Rieder meal—a meal carrying three or four times the weight of bismuth subnitrate previously used—sufficient evidence has accumulated to enable us to define normal standards of shape, position, outline and motility of the various portions of the gastro-intestinal tract.

It is now recognized that the prime factor determining the shape and position of the normal stomach is the tonus of the gastric musculature and four definite types are described, the hypertonic, the orthotonic, the hypotonic and the atonic. This tonus, although an inherent property of the gastric musculature, is subject to nervous influences, locally through Auerbach's plexus and generally by way of the vagus and splanchnics. Other factors influencing the shape and position of the normal stomach are the quantity of gastric contents, the presence or absence of gas in the intestines, the position of the diaphragm, the size and position of the other abdominal organs, the condition of the pelvic floor and anterior abdominal walls, the posture of the bony skeleton and the position of the body.

The outline of the stomach, as seen either in the postero-anterior view or in the lateral view, is smooth and regular, showing the depressions produced by the peristaltic waves. Screen examination will show the gradual passage of these depressions toward the pylorus.

The motility of the stomach depends upon two factors, the peristaltic activity of the gastric musculature and the action of the pylorus. By means of the fluoroscope, one is enabled to note the depth and apparent force of the contraction waves and to divide cases into three groups depending upon the evidence of normal, increased or decreased peristaltic activity. Emotional reflexes, the nature of the food and abdominal massage may markedly alter the peristaltic activity.

The pylorus relaxes soon after the administration of the usual opaque meal allowing the passage of some of the material into the first portion of the duodenum. The relaxations and the contractions of the pylorus are, according to Cannon, controlled by the degree of acidity upon the gastric and duodenal sides of the sphincter respectively. The rate of gastric emptying depends, therefore, upon the combined action of gastric peristalsis and pyloric relaxation. The normal stomach empties itself in from two to four hours depending upon the character of the meal, the type of the stomach, the posture and the emotional state of the individual. The presence of a residue in the stomach six hours after the administration of the meal is conclusive evidence of the presence of some disturbance in the normal balance between the

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